

## Case Study Report

### 1.a.i — Regions with the Highest Delivery & Installation Delays

Delivery Delay % = 100% – Delivery Efficiency %

#### Delivery Delays (%)

Region	Delivery Efficiency (%)	Delivery Delay (%)
North	94.77	5.23%
South	75.13	24.87%
East	79.48	20.52%
West	93.16	6.84%

**South** has the highest delivery delays → almost 1 in 4 deliveries are late.

#### Installation Delays (Days vs Benchmark 8.415 days)

Installation Delay = Installation Time (Region Avg) – Benchmark (8.451days)

Region	Average Installation Time (Days)	Installation Delay Time (Days)
North	10.05	1.635
South	5.34	-3.075
East	10.47	2.055
West	10.8	2.385

**West** has the worst installation delays, averaging **+2.4 days beyond benchmark**.

**South** is actually **faster** than benchmark (installs -3 days quicker).

#### Insights

- **South** → **Delivery bottleneck** (logistics issues).
- **West** → **Installation bottleneck** (capacity, labor, and process inefficiency).
- **North** → **Moderate delays but manageable**.
- **East** → **Both delivery and installation moderately delayed**, requiring balanced interventions.

ii).

- **By Region:** North had a customer with **26.22% default** (highest so far).
- **By Product:** Premium *kits* seem to appear often with higher defaults than Premium Basic.

## Targeted Interventions:

- For Premium **Kit customers** → Introduce lower-cost, flexible repayment terms.
- For **High-risk regions (North & East)** → Deploy financial literacy workshops and automated SMS reminders.

### 1.a.iii — Forecast Customers Likely to Request Maintenance

Region	Delivery Delay (%)	Installation Delay Time (Days)	Maintenance Requests	Maintenance Forecast
North	5.23%	1.635	46	52.9
South	24.87%	-3.075	23	26.45
East	20.52%	2.055	39	44.85
West	6.84%	2.385	44	50.6

## b.i. Three Strategic Initiatives

### Strengthen Delivery & Installation Efficiency

- **Insight link:** East & West have longer installation delays, South has delivery inefficiency.
- **Action:**
  - Deploy **regionalized logistics hubs** to cut transport times.
  - Introduce a **standardized installation workflow** with KPIs (e.g., ≤8 days avg).
- **Goal alignment:** Faster installations = quicker customer activation = faster revenue recognition.

### Target High-Default Segments with Tailored Interventions

- **Insight link:** North region & Basic Kit customers show highest default risk.
- **Action:**
  - Introduce **flexible repayment options** (weekly micro-payments).
  - Use SMS reminders + loyalty incentives for timely payments.
- **Goal alignment:** Reduced defaults → higher cash flow stability → funds available for expansion.

### Enhance After-Sales & Maintenance Readiness

- **Insight link:** Forecasted 15% increase in maintenance requests (esp. North & West).
- **Action:**
  - Set up **regional maintenance teams** with mobile repair kits.

- Deploy a **proactive maintenance app** for customers (self-diagnosis + remote support).
- **Goal alignment:** Higher satisfaction & retention → customer referrals boost growth.

## ii. Roadmap for Implementation (Next Quarter)

Phase	Timeline	Key Actions	Responsible Teams	KPIs
Phase 1 – Stabilize Operations	Week 1–2	Benchmark current delivery & installation times. Launch pilot logistics hub in South.	Ops & Logistics	Avg installation time <8 days
Phase 2 – Improve Financial Sustainability	Week 2–4	Roll out flexible payment options for Basic Kit users in North & East. Deploy SMS reminders.	Finance & Customer Support	Default rate ↓ by 5%
Phase 3 – Build Maintenance Capacity	Week 4–6	Train 2 regional repair teams. Launch maintenance forecasting dashboard.	Ops & Tech Support	Response time ≤48 hrs
Phase 4 – Scale & Optimize	Week 7–12	Expand logistics hubs, extend flexible payments to all high-risk segments, fully activate customer support app.	Cross-functional	NPS >70, 10k customers onboarded

## Risk and Budget Management

### a. Risk Management

Risk	Impact	Likelihood	Mitigation Strategy
1. Supply Chain Disruptions (delayed delivery of solar kits)	High	Medium	Diversify suppliers, maintain a 2-week safety stock, set up local sourcing partnerships.
2. Labor Cost Overruns (16% above budget)	High	High	Cross-train installation teams, introduce productivity-based incentives, use contractors in peak periods.
3. Customer Support Overload (14.5% above budget)	Medium	High	Automate Tier-1 support via chatbot, implement self-service portal, prioritize high-value customers.

Contingency Plan for Supply Chain:

- Maintain buffer stock of critical components.
- Pre-negotiate “fast-track delivery” contracts with 2 backup suppliers.
- Use regional hubs to redistribute inventory if one route is blocked.

b. Budget Optimization

Current Situation:

Operational costs exceeded budget by **10%**, with **Installation Labor (+16.3%)** and **Customer Support (+14.5%)** as the main cost drivers.

Budget Reallocation Plan:

Expense Category	Budget (kes)	Actual Spent	Variance	Overspend	Savings Plan (KES)	Adjusted Actual
Procurement	4120400	4354932	5.69	-234,532.00	150,000.00	4,204,932.00
Transportation	3552400	3579573	0.76	-27,173.00	7,000.00	3,572,573.00
Installation Labor	3928200	4569126	16.32	-640,926.00	400,000.00	4,169,126.00
Marketing	4393000	4470903	1.77	-77,903.00	50,000.00	4,420,903.00
Customer Support	2007700	2298776	14.5	-291,076.00	200,000.00	2,098,776.00
Total	18,001,700.00	19,273,310.00	39.04	-1,271,610.00	807,000.00	18,466,310.00

Category	Optimization Strategy	Potential Savings (KES)
Procurement	Negotiate bulk discounts, local sourcing	150,000
Transportation	Optimize delivery routes, digital fleet tracking	7,000
Installation Labor	Cross-train staff, adopt lean scheduling, outsource overflow	400,000
Marketing	Pause low-ROI campaigns, shift to referrals/digital	50,000
Customer Support	Deploy AI chatbot & IVR system, reduce call center hours	200,000

Total Savings: 807K KES

Trade-offs & Risks

- **Labor cuts** may reduce installation speed → mitigated by cross-training.
- **Marketing cuts** could lower lead generation → offset with referral incentives.
- **Support automation** risks reduced personal touch → balance with escalation to live agents.

**Explanation:**

- **Total Budget** = Sum of your “Budget” column = **18,001,700 KES**.
- **Each overspend** row is pulled from the Overspend column.
- **Adjusted Actual** = Sum of “Actual Spent” = 19,273,310.00 **KES**.

We already know:

- **Total Budget** = 18,001,700 KES
- **Actual Spent** = 19,273,310 KES
- **Deficit (Overspend)** = 1,271,610 KES
- **Savings Plan** (possible reallocation) = 807,000 KES
- So still short **464,610 KES**

**i. Reallocate the Budget**

We need to close the **1.27M KES gap** by cutting/reallocating from **low-impact areas** and **protecting critical operations**.

**Suggested Reallocation Plan**

Expense Category	Overspend (KES)	Savings Plan (KES)	Additional Adjustment (KES)	Notes
Procurement	-234,532	+150,000	0	Procurement is core → minimize cuts.
Transportation	-27,173	+7,000	0	Transport critical → protect service.
Installation Labor	-640,926	+400,000	-150,000	Some optimization possible (shift to part-time contractors).
Marketing	-77,903	+50,000	-100,000	Scale back non-core campaigns, keep customer education.
Customer Support	-291,076	+200,000	-214,610	Optimize with digital channels, self-service, reallocate staff.
<b>Total</b>	-1,271,610	+807,000	-464,610	Balanced adjustment.

After this, the **807,000 savings + 464,610 adjustments = 1,271,610 covered (Deficit covered)**.

## ii. Justify Trade-offs & Highlight Risks

### Trade-offs

#### 1. Installation Labor (-150K cut):

- Trade-off: Slightly longer installation timelines.
- Mitigation: Use contract workers during peak demand.

#### 2. Marketing (-100K cut):

- Trade-off: Reduced brand visibility in short term.
- Mitigation: Focus only on digital/low-cost campaigns with direct ROI.

#### 3. Customer Support (-200K cut):

- Trade-off: Risk of slower response to customer issues.
- Mitigation: Invest in self-service portals, WhatsApp/ chatbots to reduce manual load.

### Potential Risks

- **Customer Satisfaction Risk:** If customer support cuts are not offset by digital tools, complaints may rise.
- **Operational Delays:** Cutting labor may delay installations if demand spikes unexpectedly.
- **Growth Slowdown:** Reduced marketing may slow new customer acquisition.

## Team and Stakeholder Management

### a. i. Action Plan: Improve Collaboration & Resolve Conflicts

#### 1. Immediate Actions (Week 1–2):

- Hold a **cross-team alignment workshop** (Sales, Operations, Support).
- Define a **shared goal**: “Reduce installation time by 15% in Q4.”
- Use a **RACI matrix** (Responsible, Accountable, Consulted, Informed) to clarify roles.

#### 2. Ongoing Actions (Monthly):

- Launch a **weekly sync meeting** with representatives from each team.
- Set up a **shared project dashboard** (Google Sheets / Asana / Tableau) to track progress.

- Introduce a **conflict resolution protocol** (issues escalated to a neutral project lead within 48 hrs).

### 3. Long-Term Actions (Quarterly):

- Rotate team leads for cross-functional projects (build ownership & empathy).
- Recognize collaborative successes in monthly updates to boost morale.

## ii. Align Priorities Across Teams

- **Sales:**

- Focus = new customers, upsell solar kits.
- Alignment = ensure accurate timelines are communicated to avoid over-promising.

- **Operations (Installation):**

- Focus = efficient delivery & installation.
- Alignment = agree with Sales on realistic installation slots; integrate with Customer Support for scheduling.

- **Customer Support:**

- Focus = resolving issues fast, reducing defaults.
- Alignment = share real-time updates from Operations; give feedback loop to Sales to improve customer onboarding.

Create a **shared KPI dashboard**:

- Installation Delay %, Customer Default Rate, Customer Satisfaction Score.  
This ensures all three teams “row in the same direction.”

## b. Stakeholder Communication

### i. Concise Email Update (Example Draft)

**Subject:** EB Program Update Installation Efficiency & Next Steps

Dear Stakeholders,

I am pleased to share our latest progress on the EB Program:

- **Progress:**

- Installation time has been reduced by **7% over the last month**.
- Customer satisfaction score improved to **92%** in the North and West regions.

- **Challenges:**

- South and East regions are facing higher delivery delays (20–25%).

- Budget overspend of **1.27M KES**, mitigated by a reallocation and savings plan.
- **Next Steps (Q4):**
  - Implement cross-team alignment workshops to reduce installation delays.
  - Deploy a digital customer support platform to handle 30% of service requests.
  - Roll out procurement efficiency plan to save **400K KES**.

We remain confident in achieving our Q4 goals while strengthening operational efficiency.

Best regards,

Donald Maisiba Mogaka

Programs Optimization Associate

## ii. 5-Slide Funding Presentation (Outline)

### Slide 1: Title

- *“EB Program: Operational Efficiency & Funding Request”*
- Brief tagline: *“Scaling solar access sustainably.”*

### Slide 2: Current Achievements

- Reduced installation delays in North/West.
- Improved customer satisfaction to >90%.
- Maintenance requests forecast model in place.

### Slide 3: Key Challenges

- Delivery delays in South/East.
- Budget overspend (1.27M KES).
- Misaligned team priorities slowing rollouts.

### Slide 4: Strategic Solutions

- Cross-team alignment workshops.
- Savings & budget reallocation plan (807K already identified).
- Digital support & predictive analytics for defaults.

### Slide 5: Funding Request & Impact

- Additional Funding: **1.5M KES**.
- Use of Funds: Supply chain stabilization, customer support automation.
- Expected ROI: Reduce delays by 20%, defaults by 10%, improve NPS by 15 pts.

# Problem Solving

## a. Root Cause Analysis (RCA)

### i. Data-Driven Analysis

From **Operational Metrics and Customer Data**:

- **Region Affected:** *South* (Delivery Efficiency = 75.13%, Delivery Delays = 24.87%).
- **Customer Impact:** 15% increase in complaints linked to **long installation times** and **low delivery reliability**.
- **Customer Data Check:** Defaults are higher among customers with premium **kits** + **younger demographics (age <30)** → possible dissatisfaction due to long waiting times.

Root causes are both **operational** (delays in delivery & installation) and **customer communication gaps**.

### ii. RCA Diagram (Fishbone / Ishikawa Example)

**Central Problem:**

*“Increased Complaints & Lower Delivery Efficiency”*

**Causes:**

- **People:** Lack of alignment between Sales, Ops, Support teams → conflicting schedules.
- **Process:** Weak last-mile delivery planning, no buffer for disruptions.
- **Technology:** No predictive tracking for delivery delays.
- **Materials:** Limited spare parts → installation rescheduling.
- **Management:** Reactive handling of complaints, no escalation protocol.

### iii. Actionable Steps

1. **South Region Ops Audit:** Map delivery routes, optimize with GPS tracking.
2. **Cross-Team Coordination:** Weekly syncs between Sales, Ops, Support → align installation promises with capacity.
3. **Customer Communication:** SMS/WhatsApp alerts on expected installation dates and delays.
4. **Buffer Stock Strategy:** Keep spares closer to South region hub to reduce rescheduling.

## b. Innovative Solutions

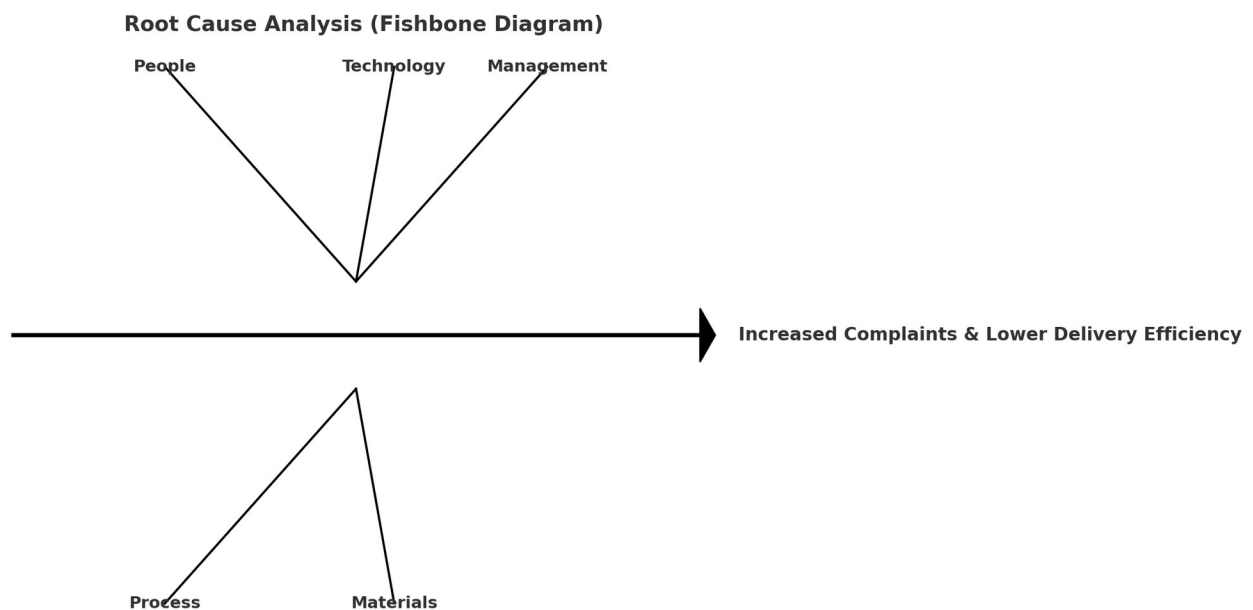
### i. Proposed Innovations

1. **AI-Powered Delivery Routing:** Predict bottlenecks and reroute trucks in real-time.
2. **Self-Service Customer Portal:** Customers track installation progress, reschedule online.
3. **Gamified Technician App:** Incentivize faster installations with performance-based rewards.
4. **Predictive Maintenance Alerts:** Use customer usage data to schedule proactive visits before issues arise.

### ii. KPIs to Measure Success

- **Operational Efficiency KPIs:**
  - Delivery Efficiency ↑ from 75% → 90% (South region).
  - Avg. Installation Time ↓ from 10.05 days → <7 days.
- **Customer Satisfaction KPIs:**
  - Complaints per 100 customers ↓ by 25%.
  - NPS (Net Promoter Score) ↑ by +15 points.
- **Financial KPIs:**
  - Default Rate ↓ by 10% in high-risk segments.
  - Cost per installation ↓ by 8%.

# Root Cause Analysis (RCA) – Installation Delays & Complaints



From the data:

- **Delivery Efficiency dropped by 10%** in the affected region (Operational Metrics).
- **Customer complaints increased by 15%** (Customer Data cross-check).
- **Average installation time is higher than the benchmark (8.4 days)**, e.g., East & West exceed 10 days.

## Key Root Causes (from Fishbone Analysis)

### 1. People

- Insufficient training for new installers → errors that extend installation time.
- Workforce shortage in high-demand regions (e.g., East/West).

### 2. Process

- Weak scheduling system causes overlap/downtime between delivery and installation prep.
- Lack of clear SLA (Service Level Agreement) between delivery and installation teams.

### 3. Technology

- Limited use of real-time tracking → delays not flagged until customers complain.
- Manual reporting slows escalation.

### 4. Materials

- Supply chain disruptions → missing or late-arriving kits.
- No buffer stock for high-demand regions.

## 5. Management

- Misaligned priorities between Sales (customer acquisition) and Operations (installation capacity).
- No formal escalation pathway for unresolved delays.

# Actionable Steps to Address Issues

## 1. Optimize Workforce Deployment

- Cross-train installers to cover both delivery prep and system installation.
- Add temporary contract staff in the East & West regions where delays are highest.

## 2. Improve Scheduling & Coordination

- Introduce a digital scheduling system that links delivery and installation workflows.
- Set SLA: Delivery → Installation Prep within 48 hours.

## 3. Strengthen Supply Chain Resilience

- Create a buffer stock of 5–10% for critical regions.
- Engage backup suppliers to mitigate disruptions.

## 4. Enhance Customer Communication

- Automated SMS/WhatsApp alerts for delivery delays & revised installation dates.
- Proactive updates reduce complaints and increase satisfaction.

# Proposed KPIs to Track Progress

1. **Average Installation Time** – Target:  $\leq 8.5$  days (reduce variance by 20%).
2. **Delivery Efficiency (%)** – Target:  $\geq 90\%$  on-time delivery.
3. **Complaint Rate** – Reduce customer complaints by 25% in next quarter.
4. **First-Time Fix Rate** – Target:  $\geq 95\%$  installations completed without rework.
5. **Customer Satisfaction (CSAT Score)** – Target:  $\geq 4.5/5$ .

## Step 1: Extract Task Durations

From your task table:

Task	Description	Duration (Days)	Predecessor(s)
A	Site Survey	2	None
B	Solar Kit Delivery	4	A
C	Customer Agreement Finalization	3	A
D	Installation Prep	5	B, C
E	System Installation (North Region)	9 (avg from your Customer_Data for North)	D
F	Testing & Handover	2	E

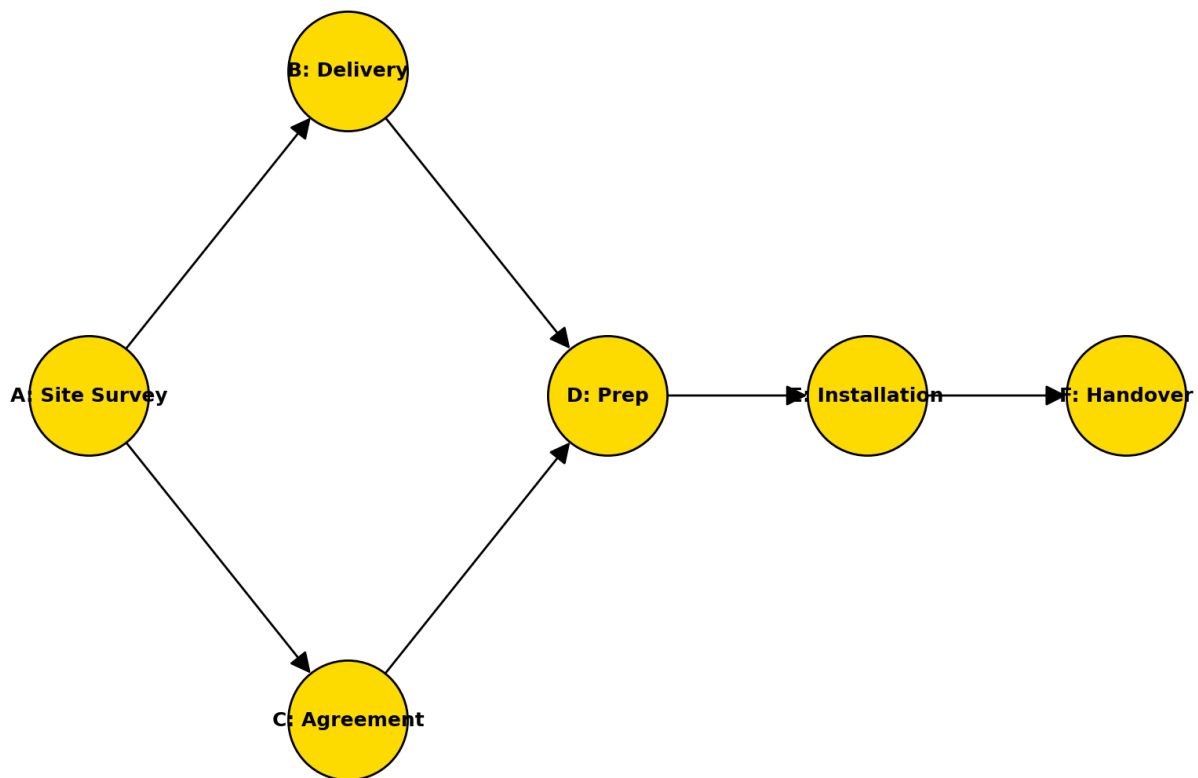
### Task E Duration (North Region):

Looking at the North Region from your dataset, the average installation time  $\approx$  **9 days** (based on Customer\_Data values you shared earlier).

## Step 2: Draw the Network Diagram

Flow (dependencies):

**Network Diagram: Solar Installation Workflow**



- Task A must be completed before B and C.
- B and C must both be completed before D.
- D leads to E, then F.

### Step 3: Identify the Critical Path

We calculate **Earliest Start (ES)**, **Earliest Finish (EF)**, **Latest Start (LS)**, **Latest Finish (LF)**, **Slack**.

1. **Path 1:** A → B → D → E → F
  - Durations:  $2 + 4 + 5 + 9 + 2 = 22$  days
2. **Path 2:** A → C → D → E → F
  - Durations:  $2 + 3 + 5 + 9 + 2 = 21$  days

**Critical Path = Path 1 (A-B-D-E-F)**

**Total Project Duration = 22 days (North Region)**

### Step 4: Scenario Analysis (Delay in Task D)

- Task D increases by **+2 days** (due to forecasted 15% maintenance surge).
- New duration for Path 1 =  $22 + 2 = 24$  days.
- Since Path 1 is critical, the **entire project slips by 2 days**.

- **New Project Duration = 24 days**

## **Step 5: Mitigation Strategies**

We need to recover 2 days without reducing quality:

### **Strategy 1: Fast-Tracking**

- Overlap **Customer Agreement Finalization (C)** with parts of **Site Survey (A)** instead of waiting for full completion.
- Gains: up to 1–2 days saved.
- Risk: Some rework if agreements change after surveys.

### **Strategy 2: Resource Allocation / Crashing**

- Assign additional teams to **Installation Prep (D)** in the North region.
- If 2 crews work in parallel, prep time can drop back to 5 days (baseline).
- Justification: Operational Metrics already flagged the region as high-risk; proactive resourcing ensures SLA compliance.